Product Data Sheet
April 2013
00813-0200-4420, Rev FA

Smart Wireless Gateway

- Gateway connects wireless self-organizing networks with any host system
- Easy configuration and management of self-organizing networks
- Easy integration into control systems and data applications through serial and Ethernet LAN connections
- Seamless integration into AMS Device Manager and DeltaV™ automation system
- Greater than 99% reliability with industry proven security
- Smart Wireless capabilities extends the full benefit of PlantWeb® architecture to previously inaccessible locations

EMERSON.
Process Management

Emerson Smart Wireless Gateway

Gain real-time process information with greater than 99% wireless data reliability

- The Smart Wireless Gateway automatically manages wireless communications in constantly changing environments
- Native integration with DeltaV and Ovation automation systems provides simple and fast commissioning for wireless field networks
- Connect to data historians, legacy host systems, and other via a LAN applications through Ethernet, Modbus, Serial, OPC, EtherNet/IP, and HART outputs

Guarantee system availability with redundant Smart Wireless Gateways

- Never lose the wireless network with hot standby capability and automatic fault detection
- Smart Wireless Gateways function as a single system, eliminating the need for duplicate host integration
- One click configuration and plug-and-play architecture

Complete wireless network configuration tools provided with each Gateway

- The integrated web interface allows easy configuration of the wireless network and data integration without the need to install additional software
- Complimentary AMS Wireless Configurator software provides Emerson Device Dashboards to configure devices and view diagnostic data

Drag and Drop device provisioning enables a secure method to add new wireless devices to the wireless field network

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Emerson's Smart Wireless Solution

IEC 62591 (*Wireless*HART®)... The Industry Standard

Self-Organizing, Adaptive Mesh Routing

- No wireless expertise required, network automatically finds the best communication paths
- The self-organizing, self-healing network manages multiple communication paths for any given device. If an obstruction is introduced into the network, data will continue to flow because the device already has other established paths. The network will then lay in more communication paths as needed for that device.

Reliable Wireless Architecture

- Standard IEEE 802.15.4 radios
- 2.4 GHz ISM band sliced into 15 radio-channels
- Time Synchronized Channel Hopping to avoid interference from other radios, WiFi, and EMC sources and increase reliability
- Direct sequence spread spectrum (DSSS) technology delivers high reliability in challenging radio environment

Emerson's Smart Wireless

Seamless Integration via a LAN to All Existing Host Systems

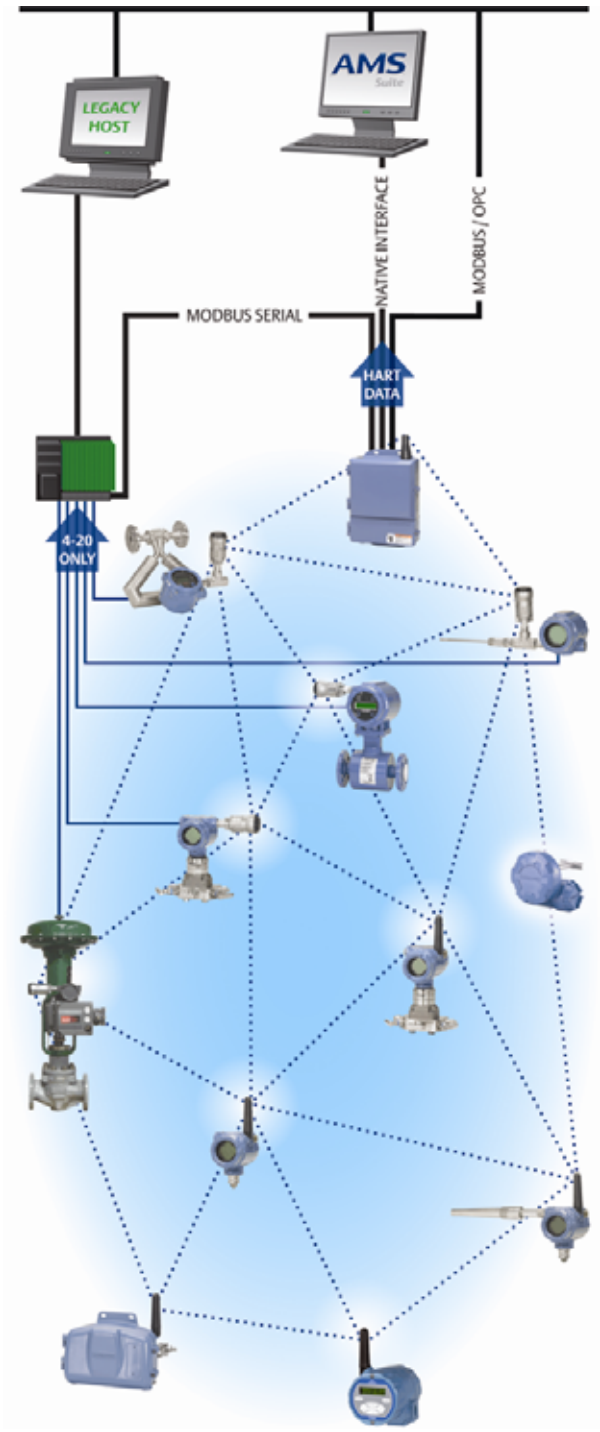
- Native integration into DeltaV and Ovation is transparent and seamless
- Gateways interface with existing host systems via a LAN, using industry standard protocols including OPC, Modbus TCP/IP, Modbus RTU, and EtherNet/IP

Layered Security Keeps Your Network Safe

- Ensures that data transmissions are received only by the Smart Wireless Gateway
- Network devices implement industry standard Encryption, Authentication, Verification, Anti-Jamming, and Key Management
- Third party security verification including Achilles and FIPS197- User based login and enforced password strength. Password strength monitoring, user based log in, password reset requirements, automatic lockout, password expiration requirements. Based on guidelines from ISA99.03.03 standard approved level two.

SmartPower™ Solutions

- Optimized Emerson instrumentation, both hardware and software, to extend power module life
- SmartPower technologies enable predictable power life



Ordering Information

Table 1. Smart Wireless Gateway Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
1420	Smart Wireless Gateway	
Power Input		
Standard		Standard
A	24 VDC Nominal (10.5-30 VDC)	★
Ethernet Communications - Physical Connection		
Standard		Standard
1[(1)(2)]	Ethernet	★
2[(3)(4)]	Dual Ethernet	★
Wireless Update Rate, Operating Frequency, and Protocol		
Standard		Standard
A3	User Configurable Update Rate, 2.4 GHz DSSS, *Wireless*HART	★
Serial Communication]		
Standard		Standard
N	None	★
A[(5)]	Modbus RTU via RS485	★
Ethernet Communication - Data Protocols		
Standard		Standard
2	Webserver, Modbus TCP/IP, AMS Ready, HART-IP	★
4	Webserver, Modbus TCP/IP, AMS Ready, HART-IP, OPC	★
5[(6)]	DeltaV Ready	★
6[(6)]	Ovation Ready	★
8	Webserver, EtherNet/IP, AMS Ready, HART-IP	★
9	Webserver, EtherNet/IP, Modbus TCP/IP, AMS Ready, HART-IP	★

Options (Include with selected model number)

Product Certifications		
Standard		Standard
N5	FM Division 2, Non-incendive	★
N6	CSA Division 2, Non-incendive	★
N1	ATEX Type n	★
ND	ATEX Dust	★
N7	IECEx Type n	★
NF	IECEx Dust	★
KD	FM & CSA Division 2, Non-incendive and ATEX Type n	★
N3	China Type n	★
N4	TIIS Type n	★
Redundancy Options		
Standard		Standard
RD[(7)(8)(9)]	Gateway Redundancy	★
Adapters		
Standard		Standard
J1	CM 20 Conduit Adapters	★
J2	PG 13.5 Conduit Adapters	★
J3	3/4 NPT Conduit Adapters	★
Antenna Options[(10)]		
Standard		Standard
WL2	Remote Antenna Kit, 50 ft. (15.2 m) cable, Lightning Arrestor	★

Table 1. Smart Wireless Gateway Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

WL3	Remote Antenna Kit, 20 ft. (6.1 m) and 30 ft. (9.1 m) cables, Lightning Arrestor	★
WL4	Remote Antenna Kit, 10 ft. (3.0 m) and 40 ft. (12.2 m) cables, Lightning Arrestor	★
Expanded		
WN2(11)	High-Gain, Remote Antenna Kit, 25 ft. (7.6m) cable, Lightning Arrestor	
Typical Model Number: 1420 A 2 A3 A 2 N5		

(1) Single active 10/100 baseT Ethernet port with RJ45 connector.

(2) Additional ports disabled.

(3) Dual active 10/100 baseT Ethernet ports with RJ45 connectors.

(4) Multiple active ports have separate IP addresses, firewall isolation, and no packet forwarding.

(5) Convertible to RS232 via adaptor, not included with Gateway.

(6) Includes Webserver, Modbus TCP, AMS Ready, HART-IP, and OPC.

(7) Requires the selection of Dual Ethernet option code 2.

(8) Not available with DeltaV Ready option code 5.

(9) Not available with EtherNet/IP option codes 8 and 9

(10) The WL2, WL3, WL4, and WN2 options require minor assembly.

(11) Not available in all countries

Accessories and Spare parts

Table 2. Accessories

Item Description	Part Number
AMS® Wireless SNAP-ON™, 1 Gateway License	01420-1644-0001
AMS Wireless SNAP-ON, 5 Gateway Licenses	01420-1644-0002
AMS Wireless SNAP-ON, 10 Gateway Licenses	01420-1644-0003
AMS Wireless SNAP-ON, 5-10 Upgrade Licenses	01420-1644-0004
Serial Port HART Modem and Cables only	03095-5105-0001
USB Port HART Modem and Cables only	03095-5105-0002

Table 3. Spare Parts

Item Description	Part Number
Spare Kit, WL2 Replacement(1), Remote Antenna, 50 ft. (15.2 m) Cable, and Lightning Arrestor	01420-1615-0302
Spare Kit, WL3 Replacement(1), Remote Antenna, 20/30 ft. (6.1/9.1 m) Cables, and Lightning Arrestor	01420-1615-0303
Spare Kit, WL4 Replacement(1), Remote Antenna, 10/40 ft. (3.0/12.2 m) Cables, and Lightning Arrestor	01420-1615-0304
Spare Kit, WN2 Replacement(1), High Gain, Remote Antenna, 25 ft. (7.6 m) Cable, and Lightning Arrestor(2)	01420-1615-0402

(1) Can not upgrade from integral to remote antenna.

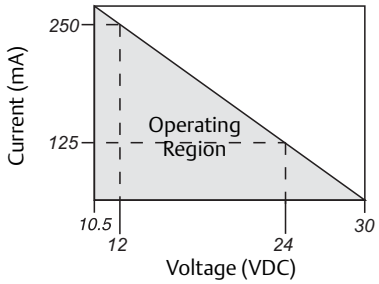
(2) Not available in all countries.

Specifications

Functional Specifications

Input Power
10.5 - 30 VDC

Current Draw
Operating Current Draw is based on 3.6 Watts average power consumption. Momentary startup Current Draw up to twice Operating Current Draw.



Radio Frequency Power Output from Antenna
Maximum of 10 mW (10 dBm) EIRP
Maximum of 40 mW (16 dBm) EIRP for WN2 High Gain option

Environmental
Operating Temperature Range:
-40 to 158 °F (-40 to 70 °C)
Operating Humidity Range:
10-90% relative humidity

EMC Performance
Complies with EN61326-1:2006.

Antenna Options
Integrated Omnidirectional Antenna
Optional remote mount Omnidirectional Antenna

Physical Specifications

Weight
10 lb (4.54 kg)

Material of Construction
Housing
Low-copper aluminum, NEMA 4X
Paint
Polyurethane
Cover Gasket
Silicone Rubber
Antenna
Integrated Antenna: PBT/PC
Remote Antenna: Fiber Glass

Certifications
Class I Division 2 (U.S.)
Equivalent Worldwide

Communication Specifications

Isolated RS485
2-wire communication link for Modbus RTU multidrop connections
Baud rate: 57600, 38400, 19200, or 9600
Protocol: Modbus RTU
Wiring: Single twisted shielded pair, 18 AWG. Wiring distance up to 4,000 ft. (1,524 m)

Ethernet
10/100base-TX Ethernet communication port
Protocols: EtherNet/IP Modbus TCP, OPC, HART-IP, HTTPS (for Web Interface)
Wiring: Cat5E shielded cable. Wiring distance 328 ft. (100 m).

Modbus
Supports Modbus RTU and Modbus TCP with 32-bit floating point values, integers, and scaled integers.
Modbus Registers are user-specified.

OPC
OPC server supports OPC DA v2, v3

EtherNet/IP
Supports EtherNet/IP protocol with 32 bit Floating Point values and Integers.
EtherNet/IP Assembly Input-Output instances are user configurable.
EtherNet/IP specifications are managed and distributed by ODVA.

Self-Organizing Network Specifications

Protocol
IEC 62591 (*Wireless*HART), 2.4 - 2.5 GHz DSSS.

Maximum Network Size
100 wireless devices @ 8 sec or higher.
50 wireless devices @ 4 sec.
25 wireless devices @ 2 sec.
12 wireless devices @ 1 sec.

Supported Device Update Rates
1, 2, 4, 8, 16, 32 seconds or 1 - 60 minutes

Network Size/Latency
100 Devices: less than 10 sec.
50 Devices: less than 5 sec.

Data Reliability
>99%

System Security Specifications

Ethernet
Secure Sockets Layer (SSL)- enabled (default) TCP/IP communications

Smart Wireless Gateway Access
Role-based Access Control (RBAC) including Administrator, Maintenance, Operator, and Executive. Administrator has complete control of the gateway and connections to host systems and the self-organizing network.

Self-Organizing Network
AES-128 Encrypted *Wireless*HART, including individual session keys. Drag and Drop device provisioning, including unique join keys and white listing.

Internal Firewall
User Configurable TCP ports for communications protocols, including Enable/Disable and user specified port numbers. Inspects both incoming and outgoing packets.

Third Party Certification
Wurldtech: Achilles Level 1 certified for network resiliency.

National Institute of Standards and Technology (NIST): Advanced Encryption Standard (AES) Algorithm conforming to Federal Information Processing Standard Publication 197 (FIPS-197)

Product certifications

Approved Manufacturing Locations

Rosemount Inc. – Chanhassen, Minnesota, USA
Emerson Process Management GmbH & Co. - Karlstein, Germany
Emerson Process Management Asia Pacific Private Limited - Singapore
Beijing Rosemount Far East Instrument Co., Limited - Beijing, China

Telecommunication Compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification. Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions. This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

Ordinary Location Certification for FM

As standard, the Gateway has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

North American Certifications

N5 FM Division 2, Non-Incendive
Certificate Number: 3028321

Nonincendive for Class I, Division 2, Groups A, B, C, and D.
Suitable for Class II, III, Division 1,
Groups E, F, and G; Indoors/outdoor locations;
Type 4X
Temperature Code: T4 (-40 °C < T_a < 60 °C)
Canadian Standards Association (CSA)

N6 CSA Division 2, Non-Incendive
Certificate Number: 1849337
Suitable for Class I, Division 2, Groups A, B, C, and D.
Dust Ignition-proof for Class II, Groups E, F, and G;
Suitable for Class III Hazardous Locations.;
Install per Rosemount drawing 01420-1011.
Temperature Code: T4 (-40 °C < T_a < 60 °C)
CSA Enclosure Type 4X

European Union Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website
at www.rosemount.com. A hard copy may be obtained by contacting your local sales representative.

European Certification

N1 ATEX Type n
Certificate Number: Baseefa 07ATEX0056X
ATEX Marking: Ex II 3 G
Ex nA nL IIC T4 (-40 °C < T_a < 60 °C)

Special condition for safe use (X):

The surface resistivity of the antenna is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

The Apparatus is not capable of withstanding the 500V insulation test required by Clause 9.4 of EN 60079-15: 2005. This must be taken into account when installing the apparatus.

ND ATEX Dust
Certificate Number: Baseefa 07ATEX0057

ATEX Marking: Ex II 3 G
Ex tD A 22 IP66 T135 (-40 °C < T_a < 60 °C)
Maximum working Voltage = 28 V

N7 IECEx Type n
Certificate Number: IECEx BAS 07.0012X
Ex nA nL IIC T4 (-40 °C ≤ T_a ≤ 60 °C)
Maximum working voltage = 28 V

Special condition for safe use (X):

The surface resistivity of the antenna is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

The Apparatus is not capable of withstanding the 500 V insulation test required by Clause 9.4 of EN 60079-15: 2005. This must be taken into account when installing the apparatus.

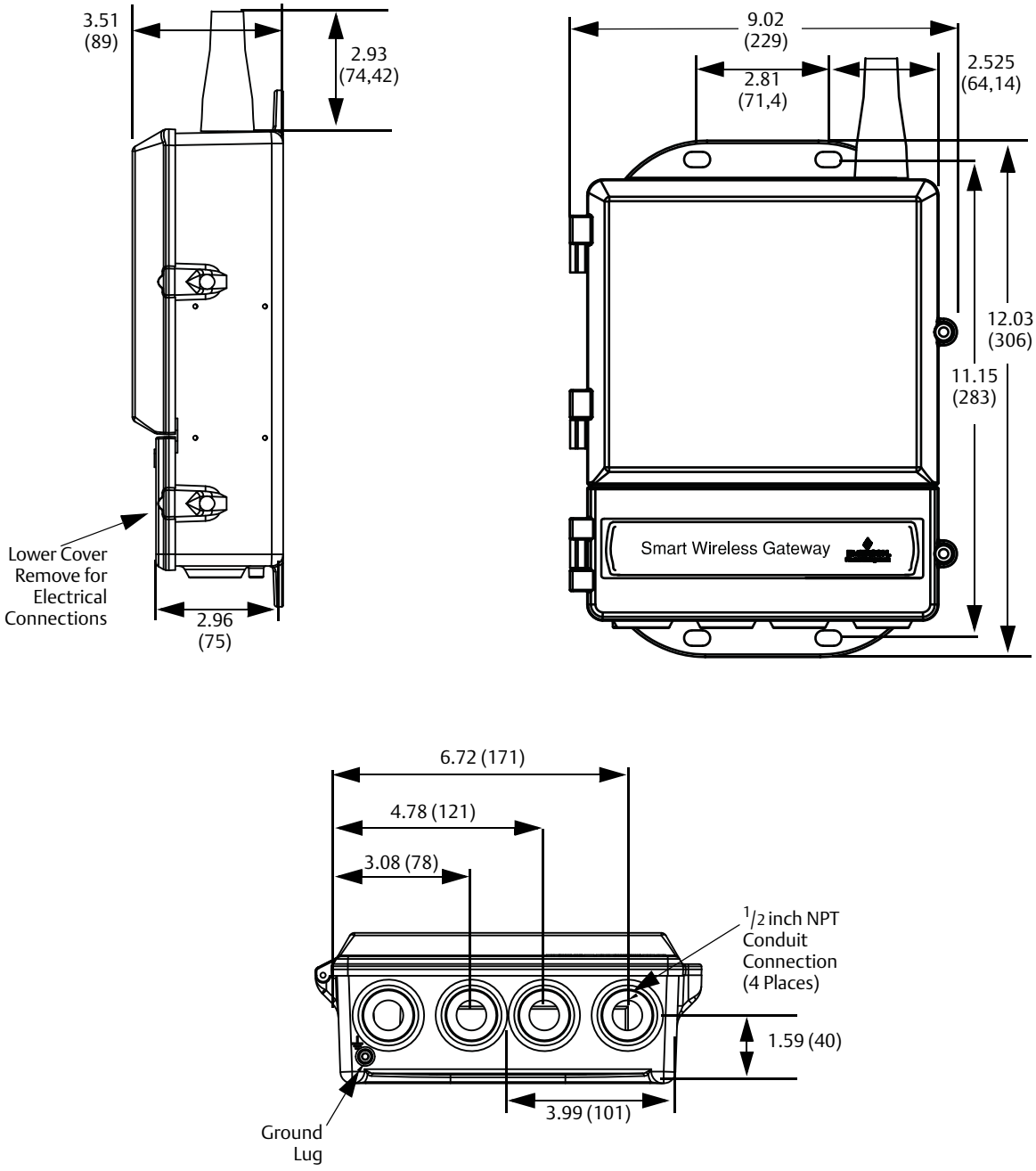
NF IECEx Dust
Certification Number: IECEx BAS 07.0013
Ex tD A22 IP66 T135 (-40 °C < T_a < 60 °C)
Maximum working voltage = 28 V

Combinations of Certifications

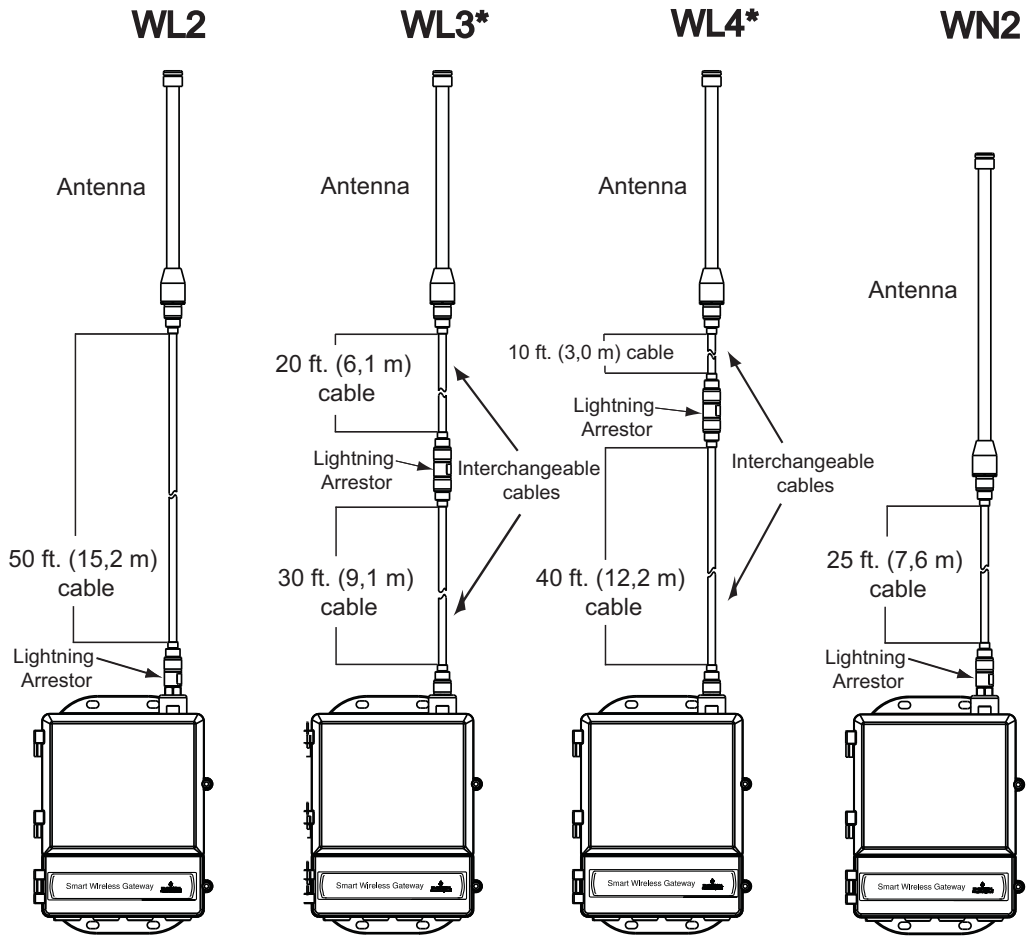
KD Combination of N5, N6, and N1.

Dimensional drawings

Figure 1. Smart Wireless Gateway Dimensions are in inches (millimeters)



Remote Antenna Kit



The Remote Antenna kit includes sealant tape for remote antenna connection, as well as mounting brackets for the antenna, Lightning Arrestor, and the Smart Wireless Gateway.

Lightning protection is included on all the options.

**Note that the cables lengths on the remote antenna options WL3 and WL4 are interchangeable for installation convenience.*

Emerson Process Management
Rosemount Inc.
8200 Market Boulevard
Chanhassen, MN 55317 USA
T (U.S.) 1-800-999-9307
T (International) (952) 906-8888
F (952) 906-8809
www.rosemount.com

Emerson Process Management
Blegistrasse 23
P.O. Box 1046
CH 6341 Baar
Switzerland
T +41 (0) 41 768 6111
F +41 (0) 41 768 6300
www.rosemount.com

Emerson Process Management
Asia Pacific Pte Ltd
1 Pandan Crescent
Signapore 128461
T +65 6777 8211
F +65 6777 0947
Service Support Hotline: +65 6770 8711
Email: Enquiries@AP.EmersonProcess.com
www.rosemount.com

Emerson Process Management
Latin America
1300 Concord Terrace, Suite 400
Sunrise Florida 33323 USA
Tel + 1 954 846 5030
www.rosemount.com

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